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## United States Patent [19]

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[54] CAPACITANCE MEASURING CIRCUIT AND METHOD FOR LIQUID LEAK DETECTION BY MEASURING CHARGING TIME

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[58] Field of Search ..... 324/519, 539, 555, 603, 324/663, 676, 677, 678, 679, 686; 174/11 R; 340/605

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[57] ABSTRACT

A leak detection system and method are disclosed. The capacitance of a leak detection cable is changed by a leaking liquid. A capacitance measuring circuit detects changes in the capacitance of the cable and thereby detects the presence of a leak. The capacitance measuring circuit includes an inverter, a current source, a comparator, and a timer. The inverter inverts a DC voltage to produce a mirror-image inverted DC voltage. The current source produces a constant current proportional to the mirror image inverted DC voltage and supplies the constant current to the cable such that the cable is charged. A comparator compares the voltage across the cable to the input voltage and produces a match signal when they are equal. A timer which is responsive to the match signal measures the time required for the cable to be charged. The capacitance of the cable is directly proportional to the charge time.

20 Claims, 5 Drawing Sheets

